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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,446	09/30/2003	Kent A. Burr	06005/38033	5635

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EXAMINER	
ROMAN, LUIS ENRIQUE	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 10/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/675,446	BURR ET AL.	
	Examiner	Art Unit	
	Luis Roman	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-11,16-23,28-32 and 35-37* is/are rejected.

7)☐ Claim(s) *12-15, 24-27, 33 & 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant amendment filed on 07/21/06 has been entered. Accordingly claims 1-37 have been kept original, no claims were amended or added. It also included remarks/arguments.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 16, 31, 32 & 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Eryurek et al. et al. (US 6594603).

Regarding claim 1 Eryurek et al. discloses a communication bus suitable for use in a hazardous area of a process plant (Col. 6 lines 13-16 & Fig. 4 element 28), the communication bus comprising: a first transmission path adapted to communicate electrical signals in a first direction (Fig. 1 pair 8 & Fig. 4 signal coming into <← I> of element 70); a second transmission path adapted to communicate electrical signals in a second direction (Fig. 4 signals coming out <I →> of element 70); and a safety device coupled to each of the first and second transmission paths (Col. 6 lines 13-16 & Fig. 4 element 14), wherein the safety device includes a control unit (Fig. 4 element 18) adapted to detect a fault condition associated with the communication bus (Col. 1 lines 20-33 & Fig. 2 elements 12, 16), and wherein the safety device further includes a switch unit adapted to interrupt the flow of electrical signals along each of the first and second transmission paths in response to the detected fault condition (Col. 8 line 65 to Col. 9 line 6).

Regarding claim 2 Eryurek et al. discloses the communication bus of claim 1. Eryurek et al. further discloses wherein the detected fault condition associated with the communication bus includes at least one of an open circuit, an electrical discontinuity, a cut in the communication bus, a severed communication bus, and a disconnected end of the communication bus (Col. 9 line 12-25).

Regarding claim 3 Eryurek et al. discloses the communication bus of claim 1. Eryurek et al. further discloses including a third transmission path (Fig. 1 coming out of element 6 and counting from top down the second wire) and a fourth transmission path (Fig. 1 coming out of element 6 and counting from top down the fourth wire), wherein the safety device is coupled to each of the third and fourth transmission paths (Fig. 1 elements 6 and wires counting from top down the second and fourth one).

Regarding claim 4 Eryurek et al. discloses the communication bus of claim 3. Eryurek et al. further discloses wherein each of the first, second, third, and fourth transmission paths includes twisted pair cable or coaxial cable (Col. 2 lines 42-45).

Regarding claim 5 Eryurek et al. discloses the communication bus of claim 3. Eryurek et al. further discloses wherein the control unit includes a first control device (Fig. 1 element 4<left>) coupled to the third transmission path (Fig. 1 wire counting from top down, second one) and a second control device (Fig. 1 element 4<right>) coupled to the fourth transmission path (Fig. 1 wire counting from top down, fourth one), wherein the first control device includes a first signal source adapted to generate an electrical signal that is communicated in the first direction along the third transmission path (Fig. 4 signal coming from element 6 thru wire counting from top down, second one) and wherein the second control device includes a second signal source adapted to generate an electrical signal that is communicated in the second direction along the fourth transmission path (Fig. 4 signal coming from element 6 thru wire counting from top down, fourth one).

Regarding claim 6 Eryurek et al. discloses the communication bus of claim 5. Eryurek et al. further discloses wherein the first control device includes a first sensor (Col. 3 lines 7-13 & Fig 1 element 4 & Fig. 4 element 12) adapted to measure an electrical characteristic associated with the third transmission path, and wherein the second control device includes a second sensor (Col. 3 lines 7-13 & Fig. 1 element 4 & Fig. 4 element 12) adapted to measure an electrical characteristic associated with the fourth transmission path.

Regarding claim 7 Eryurek et al. discloses the communication bus of claim 6. Eryurek et al. further discloses wherein the measured electrical characteristic associated with each of the third and fourth transmission paths include current (col. 3 lines 37-39), voltage, or resistance.

Regarding claim 8 Eryurek et al. discloses the communication bus of claim 6. Eryurek et al. further discloses wherein the first control device includes a first comparator (Col. 5 lines 26-31 & Fig. 4 element 60) adapted to compare the measured electrical characteristic associated with the third transmission path to a normal operational value, and wherein the second control device (Col. 5 lines 26-31 & Fig. 4 element 60) adapted to compare the measured electrical characteristic associated with the fourth transmission path to the normal operational value.

Regarding claim 9 Eryurek et al. discloses the communication bus of claim 8. Eryurek et al. further discloses wherein the switch unit includes a first switch coupled to the first control device and a second switch coupled to the second control device (Col. 8 line 65 to Col. 9 line 6).

Regarding claim 10 Eryurek et al. discloses the communication bus of claim 9. Eryurek et al. further discloses wherein at least one of the first switch, the second switch, the first control device, and the second control device is housed in a protective enclosure (Fig 1 shows the control devices 4 in housings).

Regarding claim 16 Eryurek et al. discloses a safety device adapted for use in a hazardous area of a process plant (Col. 6 lines 13-16), the safety device comprising: a communication bus including a first transmission line (Fig. 1 pair 8 & Fig. 4 signal coming into <← I> of element 70) and a second transmission line (Fig. 4 signals coming out <I →> of element 70), wherein both the first and second transmission lines are adapted to communicate electrical signals (Col. 8 line 65 to Col. 9 line 6); a control unit coupled to the second transmission line (Fig. 4 elements 18, 70, <I →>).

Regarding claim 31 Eryurek et al. discloses a method (a person of the ordinary skill will understand a method that is intrinsically described by the functioning of the apparatus) for providing a communication bus suitable for use in a hazardous area of a process plant (Fig.1 element 36), the method comprising: communicating electrical signals (Col. 3 lines 59-62) along a first transmission path (Fig. 1 element 36 from 34 to 32left); communicating electrical signals along a second transmission path (Fig. 1 element 36 from 32left to 34); measuring an electrical characteristic associated with the second transmission path (Col. 9 lines 24-29); detecting a fault condition associated with the communication bus in response to the measured electrical characteristic associated with the second transmission path; and interrupting the flow of electrical signals along the first transmission path in response to the detected fault condition associated with the communication bus (Claim 19).

Regarding claim 32 Eryurek et al. discloses the method of claim 31.
Christensen et al. further discloses wherein detecting the fault condition associated with the communication bus includes detecting at least one of an open circuit, an electrical discontinuity, a cut in the communication bus, a severed communication bus, and a disconnected end of the communication bus (Col. 7 lines 26-44).

Regarding claim 35 Eryurek et al. discloses the method of claim 31. Christensen et al. further discloses wherein measuring the electrical characteristic associated with the second transmission path includes measuring current, voltage, or resistance (Col. 4 lines 53-64 & Fig. 3 element 52).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11, 17, 18, 19, 20, 21, 22, 23, 28, 29, 30, 33, 34, 36 & 37 are rejected under 35 U.S.C. §103(a) as being unpatentable over Eryurek et al. (US 65946038) in view of Christensen et al. (US 6912671).

Regarding claim 11 Eryurek et al. discloses the communication bus of claim 9. Eryurek et al. does not disclose wherein the first switch includes a first relay and a second relay, and the second switch includes a third relay and a fourth relay, wherein each of the first and second relays is coupled to the first control device, and wherein each of the third and fourth relays is coupled to the second control device.
Christensen et al. teaches wherein the first switch (Fig. 3 element 150) includes a first relay and a second relay (Col. 10 lines 8-14), and the second switch (Fig. 3 element 150) includes a third relay and a fourth relay (Col. 10 lines 8-14), wherein each of the first and second relays is coupled to the first control device (Fig. 3 relays from element 150 connected to smart field devices <Fig. 1 elements 22, 24, 26> thru line 30), and wherein each of the third and fourth relays is coupled to the second control device

(same as for first control device, note that in Eryurek et al. device the control devices <Fig. 1 elements 4left & 4right> included the switch <Col. 8 line 65 to Col. 9 line 6>).
It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eryurek et al. device with the Christensen et al. device features, since relays are devices used to connect/disconnect control devices and which provide high reliability. Both devices are in the same problem solving area of Fieldbus communication for industrial processes.

Regarding claim 17 Eryurek et al. discloses the safety device of claim 16.
Christensen et al. further discloses wherein the control unit includes a sensor (Col. 4 lines 53-64) adapted to measure an electrical characteristic associated with the second transmission line (Fig. 2 elements 128, 30).
It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Eryurek et al. device with the Christensen et al. device features because it increases reliability in the control apparatus working in a hazardous environment such as industrial processes.

Regarding claim 18 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 17.
Christensen et al. further discloses wherein the measured electrical characteristic associated with the second transmission line includes current, voltage, or resistance (Col. 4 lines 53-64 & Fig. 3 elements 152, 158, 160, 168).

Regarding claim 19 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 17.
Christensen et al. further discloses wherein the control unit includes a comparator (Col. 13 lines 6-19 & Fig. 4A element 210) adapted to compare the measured electrical characteristic associated with the second transmission line to a normal operational value.

Regarding claim 20 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 19.
Eryurek et al. further discloses wherein the first transmission line includes a first transmission signal path adapted to communicate electrical signals in a first direction, and a second transmission signal path adapted to communicate electrical signals in a second direction (Col. 6 lines 30-38).

Regarding claim 21 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 20.
Eryurek et al. further discloses wherein the second transmission line (Fig. 1 third & fourth wires, counting from top down) includes a third transmission signal path (Fig. 1 third wire, counting from top down) adapted to communicate electrical signals in the first direction, and a fourth transmission signal path (Fig. 1 fourth wire, counting from top down) adapted to communicate electrical signals in the second direction.

Regarding claim 22 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 21.
Christensen et al. further discloses wherein each of the first, second, third, and fourth transmission signal paths includes one wire or two wires (Col. 5 lines 36-43).

Regarding claim 23 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 21.
Eryurek et al. further discloses wherein the control unit includes a first control device (Fig. 1 element 4<left>) coupled to the third transmission signal path (Fig. 1 second wire, counting from top down) and a second control device (Fig. 1 element 4<right>) coupled to the fourth transmission signal path (Fig. 1 fourth wire, counting from top down).

Regarding claim 28 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 16.
Eryurek et al. further discloses wherein each of the first and second transmission lines includes a twisted pair cable or a coaxial cable (Col. 2 lines 42-45).

Regarding claim 29 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 16.
Christensen et al. further discloses wherein the first transmission line is adapted to communicate electrical signals using a communication protocol based on Ethemet, Fieldbus (Col.4 lines 53-64), HART, PROFIBUS, WORLDFIP, Device-Net, As-Interface, or CAN.

Regarding claim 30 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 16.
Eryurek et al. further discloses wherein the control unit (Fig. 1 element 4) includes a signal source adapted to generate an electrical signal (Fig. 1 elements 64, 70) that is communicated along the second transmission line (Fig. 1 element <I →>).

Regarding claim 33 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 31.
Eryurek et al. further discloses wherein communicating electrical signals along the first transmission path includes communicating electrical signals in a first direction along a first pair of transmission wires and communicating electrical signals in a second direction along a second pair of transmission wires (Fig. 1).
Christensen et al. does not specifically disclose wherein communicating electrical signals along the second transmission path includes communicating electrical signals in the first direction along a third pair of transmission wires and communicating electrical signals in the second direction along a fourth pair of transmission wires.
In other words four control devices with their respective pair of wires with signals in both directions (Col. 5 lines 36-48)

Regarding claim 34 Eryurek et al. in view of Christensen et al. discloses the safety device of claim 31.
Christensen et al. further discloses wherein communicating electrical signals along the first transmission path includes communicating electrical signals in a first direction along a first transmission wire and communicating electrical signals in a second direction along a second transmission wire, and wherein communicating electrical signals along the second transmission path includes communicating electrical signals in the first direction along a third transmission wire and communicating electrical signals in the second direction along a fourth transmission wire (Col. 5 lines 36-48).

Regarding claim 36 Eryurek et al. in view of Christensen et al. discloses the method of claim 31.
Christensen et al. further discloses including comparing the measured electrical characteristic associated with the second transmission path to a normal operational value (Col. 13 lines 6-19 & Fig. 4A element 210).

Regarding claim 37 Eryurek et al. in view of Christensen et al. discloses the method of claim 36.
Christensen et al. further discloses wherein interrupting the flow of electrical signals along the first transmission path includes opening switch contacts coupled to the first transmission path in response to a change in the measured electrical characteristic associated with the second transmission path from the normal operational value (Claim 19).

Allowable Subject Matter

Claims 12, 13, 14, 15, 24, 25, 26, 27, 33, & 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's arguments filed 07/21/06 have been fully considered but they are not persuasive.

Regarding the arguments to claim 1 limitation "a safety device coupled to each of the first and second transmission paths". The examiner rejected it with Eryurek et al.'603 (Col. 6 lines 13-16 & Fig. 4 element 14).

The analysis applied is as follows:

Based on the paragraph cited if there is a circuit (28), which can be configured to have a safety operation. Then, this circuit it's a safety circuit.

If circuit (14) communicates with the process devices (4), it means there is a link between circuits (28) and process devices (4)(every path). As a conclusion the paths are linked (coupled) to a safety device, as required by the limitation.

Regarding the arguments to claim 1 limitation "a switch unit adapted to interrupt the flow of electrical signals along each of the first and second transmission paths in response to the detected fault condition". The examiner rejected it with Eryurek et al.'603 (Col. 8 line 65 to Col. 9 line 6).

Based on the paragraph cited the safety device (28) can perform: remotely, in a process control device, in the control room, computer located off-site or combination of them. The reference relies on software and microprocessor, which can reside in a control room, or a final control element such as: valve, motor or switch.

Furthermore, in Col. 9 lines 12-25 the reference teaches detection of degradation prior to the ultimate failure, such as loose termination, cold solder. As a conclusion the detection, the control, switches and the communication paths are the elements that define the limitation.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis E. Román whose telephone number is 571-272-5527. The examiner can normally be reached on Mon – Fri from 7:15 AM to 3:45 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800 x 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from Patent Application Information Retrieval (PAIR) system.

Status information for unpublished applications is available through private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Luis E. Román
Patent Examiner
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